ACIDIC FIBROBLAST GROWTH FACTOR (aFGF) STIMULATES AXONAL REGENERATION, R.G. Hill, J.M.A. Laird, G.S. Mason, K.A. Thomas, S. Boyce, F.D. Tattersall and R.J. Hargreaves, Merck, Sharp and Dohme Research Laboratories, Neuroscience Research Centre, Terlings Park, Harlow, Essex, CM20 2QR, UK.

aFGF is a member of the fibroblast growth factor family. It has mitogenic effects on many non-neuronal cells but also supports the survival, neurite growth and differentiation of neuronal cells 'in vitro'. It is present in peripheral nerves in high concentration and seems to originate from the cell bodies of sensory and motor nerve fibres.

The action of aFGF on peripheral nerve lesions, made under general anaesthesia, has been studied in adult rats. aFGF given topically to the site of a sciatic nerve crush injury or intravenously, stimulated the regeneration of motor axons and of myelinated sensory axons. Dose dependent increases in regeneration distance were seen after 3.6, 36 or 360 ng/day topically or after 3 or 10 μg/kg systemically. In a second series of experiments, the effects of aFGF were studied where peripheral neuropathy had been produced by loose ligation of one sciatic nerve. A dose-related effect of aFGF on thermal hyperalgesia was seen after intravenous administration of 0.03 to 3 μg/kg/day for 7 days.

The administration of heparin, a necessary factor for the activity of aFGF, had no effect on nerve regeneration when given alone.

We conclude that, as crush injury has little effect on the endoneurial tubes and supporting cells, the regenerative effects of aFGF are likely to be due to a direct acceleration of neuronal extension. It is possible that aFGF may be clinically useful in the treatment of peripheral neuropathy.